

## CLAIMS

- 1 1. A method comprising  
2 running client modules on mobile devices,  
3 running a server module on a server that is accessible  
4 through a communication network, and  
5 running link modules on link devices that have  
6 communication channels to the mobile devices and are capable of  
7 accessing the server through the communication network,  
8 the client, server, and link modules providing core services  
9 through application programming interfaces to applications  
10 running on the mobile devices, the server, and the link devices.
- 1 2. The method of claim 1 in which service applications also  
2 run on the client modules to enable users of the mobile devices to  
3 manage the core services.
- 1 3. The method of claim 1 in which the core services include  
2 interaction with short-range wireless transceivers in the mobile  
3 devices.
- 1 4. The method of claim 1 in which a mobile device operating  
2 system is also running on the mobile devices and the client  
3 modules use services of the operating system.

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1 5. The method of claim 1 in which the mobile devices include  
2 personal digital assistants or mobile phones.

1 6. The method of claim 1 in which the core services include at  
2 least one of the following: broadcast of information about real-  
3 world services; interaction with a wireless transceiver in the  
4 mobile device; guaranteed message delivery; and encryption.

1 7. Apparatus comprising

2 mobile devices including client modules configured to run  
3 on the devices,

4 a server including a server module that is configured to be  
5 accessible through a communication network, and

6 link devices including link modules that are configured to  
7 use communication channels to the mobile devices and to access  
8 the server through the communication network,

9 the client, server, and link modules being configured to  
10 provide core services through application programming interfaces  
11 to applications running on the mobile devices, the server, and the  
12 link devices.

1 8. The apparatus of claim 7 in which the mobile devices  
2 include short-range wireless transceivers.

1 9. The method of claim 1 in which the mobile devices include  
2 personal digital assistants or mobile phones.

1 10. A method comprising

2 running client modules on wireless devices, the client  
3 modules providing core services through application programming  
4 interfaces to applications running on the devices, at least some of  
5 the applications being associated with real-world services that are  
6 provided by individuals or enterprises,

7 maintaining information identifying relationships between  
8 each of the real-world services and at least one of the devices  
9 through which the service is provided,

10 the core services providing a sharing among the devices of  
11 the information identifying the relationships between the real-  
12 world services and the devices.

1 11. The method of claim 10 in which information about the  
2 services available through each of the devices is broadcast by the  
3 core services to the other devices.

1 12. The method of claim 10 in which the real-world services  
2 associated with the devices are registered by the core services.

1 13. The method of claim 10 in which the real-world services  
2 include at least one of communication services, computational  
3 services, commercial services, or governmental services.

1 14. A method comprising:

2 maintaining in a wireless device a list of real-world  
3 services that are available from a user of the device through an  
4 application running on the device; and

5 through a wireless communication channel, broadcasting  
6 information from the device indicative of the available real-world  
7 services.

1 15. The method of claim 14 in which the information is  
2 broadcast periodically.

1 16. The method of claim 14 in which another wireless device  
2 that receives the broadcast information accesses one of the  
3 available real-world services.

1 17. Apparatus comprising:

2 a wireless device containing a list of real-world services  
3 that are available from a user of the device through an application  
4 running on the device; and

5 a medium storing a program that configures the wireless  
6 device to broadcast information over a wireless communication  
7 channel from the device about the available real-world services.

1 18. A method comprising

2 running client modules on mobile devices that are  
3 associated with identified users,

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4 running a server module on a server that is accessible on a  
5 communication network,

6 running link modules on link devices that have  
7 communication links to the mobile devices and are capable of  
8 accessing the server through the communication network,

9 the client modules providing core services through  
10 application programming interfaces to applications running on the  
11 mobile devices,

12 receiving a message from a user of one of the mobile  
13 devices through one of the applications running on the device, the  
14 message being directed to another user of an application running  
15 on another one of the mobile devices, and

16 delivering the message to the other user through the  
17 Internet.

1 19. The method of claim 18 in which the message is sent  
2 through the links and the server.

1 20. The method of claim 18 in which the client module running  
2 on the device from which the message is sent determines whether  
3 the target mobile device is within short-range wireless distance,  
4 and, if not, the client module forwards the message to one of the  
5 link modules.

1 21. The method of claim 20 in which the link module forwards  
2 the message to the server through the Internet.

1 22. The method of claim 21 in which the server module  
2 determines the location of the target mobile device and identifies a  
3 communication channel through which to forward the message to  
4 the other user.

1 23. A method comprising:

2 maintaining a list of short-range wireless devices within  
3 range of a first short-range wireless device;

4 transmitting a message from an identified user of the first  
5 device to a second identified user of a second wireless device over  
6 a communication medium,

7 the communication medium being selected based at least in  
8 part on whether the second device is included on the list, the  
9 selection being transparent to the user of the first device.

1 24. The method of claim 23 in which, if the second device is  
2 included on the list, the message is transmitted to the second  
3 device over a short-range radio link, and if the second device is not  
4 included on the list, the message is transmitted to the second  
5 device using another communication medium.

1 25. The method of claim 23 in which, if the second device is  
2 not included on the list, the message is transmitted to the second  
3 device over either the Internet or by mobile telephony.

1 26. A method comprising:

2 transmitting a message from an identified user of a short-  
3 range wireless device to an identified user of another device; and  
  
4 automatically confirming to the identified user of the first  
5 device whether the transmitted message was received by the  
6 identified user of the other device.

1 27. The method of claim 26 including:

2 storing information about the transmitted message in the  
3 first device after transmission; and

4 checking for a match between received confirmations and  
5 the transmitted message stored in the device.

1 28. The method of claim 27 including resending the transmitted  
2 message if a confirmation for the transmitted message is not  
3 received within a specified period.

1 29. The method of claim 27 including notifying a  
2 communications manager in the first device if the transmitted  
3 message is undeliverable.

1 30. The method of claim 29 in which the notifying includes  
2 providing an explanation of why the transmitted message was  
3 undeliverable.

1 31. The method of claim 29 also including removing the  
2 transmitted message from the device after it is confirmed that the

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3 transmitted message was received by the identified user of the  
4 other device.

1 32. The method of claim 27 in which the device from which  
2 the message is transmitted is responsible for guaranteeing the  
3 delivery.

1 33. A method comprising

2 running applications on devices that are associated with  
3 respective owning entities,

4 sending a message from an initiating owning entity to a  
5 target owning entity using one of the applications running on one  
6 of the devices associated with the initiating owning entity,

7 identifying one of the devices as being associated with the  
8 target owning entity and as being accessible by a communication  
9 link, and

10 forwarding the message to the device that is associated with  
11 the target owning entity through the communication link.

12 each of the devices running a client module that encrypts  
13 and decrypts the message using a public key associated with the  
14 owning entity of the device.

1 34. The method of claim 33 in which the public key is stored in  
2 the device and in a server through which the message passes.

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1 35. The method of claim 33 in which the device comprises a  
2 mobile device.

1 36. The method of claim 35 in which the owning entity  
2 comprises a person.

1 37. The method of claim 33 in which the owning entity  
2 comprises an enterprise and the device comprises a stationary  
3 device.

1 38. A method comprising

2 in a server, storing information that identifies real-world  
3 entities and defines modes of interaction by the real-world entities  
4 through distributed devices, each of the real-world entities  
5 providing services to other real-world entities and using services of  
6 other real-world entities,

7 enabling any of the real-world entities using any arbitrary  
8 one or more of the distributed devices to log into the server,

9 loading portions of the stored information from the server  
10 to the device being used, and

11 regulating the interaction of the real-world entity using the  
12 device with other real-world entities based on the stored  
13 information, the interaction including the use of the services of the  
14 other real-world entities.

1 39. The method of claim 38 also including

2 running client modules on the device,

3 running a server module on a server that is accessible on a  
4 communication network,

5 the client and server modules providing core services  
6 through application programming interfaces to applications  
7 running on the devices,

8 the core services including access to the information that is  
9 stored on the server and relates to real-world entities.

1 40. The method of claim 39 in which the stored information  
2 includes at least one of identification information, demographic  
3 information, and preference information.

1 41. A method comprising  
2 associating with each one of a number of different mobile  
3 devices that have a short-range wireless communication capability,  
4 a person who is a user of the device,

5 storing information about the association of devices and  
6 users and information about each of the users at a publicly  
7 accessible server, and

8 providing services at each of the mobile devices that  
9 depend on the information about the user of the device that is  
10 stored at the server.

1 42. The method of claim 41 in which the information about the  
2 users is communicated to the devices from the server for use in  
3 providing the functions.

1 43. The method of claim 41 in which the information about the  
2 users includes at least one of: demographic information,  
3 identification information, preference information, or location  
4 information.

1 44. The method of claim 41 in which at least some of the  
2 information about the users is stored on the mobile devices  
3 associated with the users.

1 45. A method comprising:  
2 recognizing automatically that an entity in possession of a  
3 short-range wireless device is within a particular geographic area;  
4 obtaining data about the entity from a commonly accessible  
5 database; and  
6 sending information to the short-range wireless device, the  
7 information sent to the device depending on the data obtained from  
8 the database.

1 46. The method of claim 45 in which access to the data about  
2 the entity in the commonly accessible database is contingent on  
3 permission of the entity.

1 47. The method of claim 45 in which the entity can access and  
2 modify its data in the commonly accessible database using the  
3 wireless device.

1 48. The method of 45 in which a second short-range wireless  
2 device recognizes that the entity is within the particular geographic  
3 area, obtains the data, and sends the information.

1 49. The method of claim 47 in which the information sent to  
2 the first device includes promotional material for facilitating a  
3 transaction with an entity associated with the second device.

1 50. The method of claim 47 in which the entity obtains  
2 information about an entity associated with the second device from  
3 the commonly accessible database using the first device.

1 51. The method of claim 47 in which recognizing that the  
2 entity is within a particular geographic area is based on receipt of a  
3 message from the first device, the message including an  
4 identification code mapped to the entity.

1 52. A method comprising:

2 electronically storing, in a publicly accessible location,  
3 information about real-world entities that are users of devices that  
4 have short-range wireless communication capability,

5 providing client modules on the devices and a server  
6 module at the publicly accessible location, the client modules and  
7 the server module cooperating to provide guaranteed messaging  
8 between users of any of the devices and to enable commercial  
9 transactions between users of the devices based on the  
10 electronically stored information.

1 53. The method of claim 52 in which

2           one of the two wireless devices is fixed and one of the two  
3 wireless devices is mobile.

1    54.    The method of claim 52 in which  
2           the user of one of the devices comprises a commercial  
3 entity.

1    55.    The method of claim 52 in which  
2           the user of one of the devices comprises a consumer.

1    56.    The method of claim 52 in which  
2           the transaction comprises delivery of marketing  
3 information from one of the two devices to the other.

1    57.    The method of claim 52 in which the transaction comprises  
2 the use by one of the two devices of a service provided by means  
3 of the other of the two devices.

1    58.    The method of claim 52 in which  
2           the transaction comprises electronic messaging.

1    59.    The method of claim 52 in which  
2           the transaction occurs when the two devices are out of  
3 range of each other.

1 60. The method of claim 52 in which access to the stored  
2 information is under the control of the user to which it pertains.

1 61. The method of claim 52 in which the stored information  
2 comprises the location of the user.

1 62. The method of claim 52 in which the stored information  
2 comprises consumption preferences of a consumer.

1 63. The method of claim 52 in which each of the users is  
2 associated with more than one of the devices.

1 64. The method of claim 52 in which the transaction is effected  
2 between the two users through the server that is located out of  
3 range of the two devices.

1 65. The method of claim 52 in which the two devices are in  
2 range of each other and the transaction is effected between two  
3 users carrying the two devices.

1 66. The method of claim 52 in which the transaction comprises  
2 sending an electronic business card from one of the devices to  
3 another one of the devices and displaying the card on the other one  
4 of the devices.

1 67. The method of claim 52 in which the transaction comprises  
2 an electronic message communicated from one of the users to the  
3 other through at least one of the two devices and by a route that  
4 includes a mode of communication that is selected from among the  
5 Internet, mobile telephony, and short-range wireless  
6 communication, the selection being made without the user's  
7 awareness.

1 68. A method comprising:  
2 at a first device, receiving information from a second  
3 device through a short-range wireless communication channel, the  
4 information identifying an actual geographic location of the second  
5 device based on signals received from GPS sources, and  
6 updating a derived geographic location stored at the first  
7 device based on the information received from second device.

1 69. The method of claim 68 in which the derived geographic  
2 location is updated to be the same as the actual geographic location  
3 of the second device.

1 70. The method of claim 68 in which the first device receives  
2 information over time from multiple other devices, the information  
3 representing the actual GPS geographic locations of the other  
4 devices, and  
5 the derived geographic location is updated from time to  
6 time based on the information received over time from the other  
7 devices.

1 71. The method of claim 68 in which the first device is mobile  
2 and the second device is stationary.

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